

## Sanctuary Background

### Generally Speaking

The Stellwagen Bank National Marine Sanctuary is a very special place. The Stellwagen Bank area was designated a National Marine Sanctuary because of its remarkable biological, geological, oceanographic and cultural features. The Sanctuary is mandated by Congress to protect these unique attributes, while allowing people to use and enjoy this ocean area in a sustainable way compatible with resource protection. The Sanctuary provides research and education programs to promote understanding of these resources and guide responsible management, as well as enforcement to assure regulatory compliance and safe use.

### Designation History

In the late 1980s, an elevated public awareness of regional development activities prompted calls for greater protection of New England's marine resources. During the summer of 1989, a series of public meetings revealed the public's concern about the impacts of certain human activities on the Stellwagen Bank ecosystem. By 1991, NOAA had received over 20,000 petitions in support of the creation of the Stellwagen Bank National Marine Sanctuary, which had been an active candidate for designation since the mid-1980s.

On October 7, 1992, Congress passed legislation re-authorizing and amending Title III of the Marine Protection, Research, and Sanctuaries Act (Title III). Stellwagen Bank National Marine Sanctuary was officially designated when that legislation was signed into law on November 4, 1992. In 1996, the Sanctuary's name was officially changed to the Gerry E. Studds Stellwagen Bank National Marine Sanctuary to honor the retiring Congressman who had played an integral role in its creation. For purposes of ease of reading this publication, general reference will simply be made to the Sanctuary.

### Related Jurisdictions

Management of the Sanctuary involves cooperation and coordination with the following federal and state agencies having regulatory responsibilities in related jurisdictions. Regular information exchange and partnership with these agencies, as well as coordination and formal consultation on related policies and rule making for resource protection, is crucial to the effectiveness of the Sanctuary's programs. Sanctuary enforcement of regulations pursuant to the enabling acts of other federal agencies having overlapping jurisdiction with the Sanctuary is possible through formal agreement. Cooperation, coordination and consultation with these agencies is clearly vital to comprehensive resource management.



Captain Henry S. Stellwagen faithfully served his nation in times of war and peace. His legacy includes an underwater feature and a National Marine Sanctuary bearing his name.

*Photograph courtesy of the Stellwagen Family*



The 133' NOAA Ship *Ferrel* (top photo) and the 76' Research Vessel *Connecticut* provide valuable platforms for studying the biodiversity and geology of the Sanctuary.

*Photographers:*  
(*Ferrel*) James Hain, ASWH  
(*RV Connecticut*) University of Connecticut website

The U.S. Coast Guard is broadly responsible for law enforcement in waters under federal jurisdiction. NOAA's National Marine Fisheries Service (NMFS) and the New England Fisheries Management Council (NEFMC) are responsible for fisheries management. The NMFS also regulates activities under the Marine Mammal Protection Act and the marine component of the Endangered Species Act. The NMFS Office of Law Enforcement shares responsibilities with the Coast Guard in enforcing these laws. The U.S. Environmental Protection Agency regulates sewage outfalls and ocean disposal activities. Certain ocean disposal activities, such as harbor dredge spoils dumping, also are permitted and monitored by the US Army Corps of Engineers. The U.S. Fish & Wildlife Service regulates activities effecting seabirds and waterfowl.

Although the Sanctuary lies entirely outside of state jurisdiction, communication and coordination with agencies of The Commonwealth of Massachusetts is necessary and beneficial. The Massachusetts Environmental Police are partners in Sanctuary enforcement with the NMFS Office of Law Enforcement and the Coast Guard. The Massachusetts Office of Coastal Zone Management works broadly with the Sanctuary to assure consistency in state-federal activities effecting coastal and ocean waters. The Massachusetts Division of Marine Fisheries manages marine resources, many of which are highly mobile and whose populations overlap Sanctuary and state waters in their geographic distribution. The Division also is a voting member of the NEFMC and thereby participates in management of fishery resources under federal jurisdiction.

### **Sanctuary Setting**

The Sanctuary is located in the southwestern corner of the Gulf of Maine, which is formed by the bight of the northwest Atlantic coastline between Cape Cod, Massachusetts and Cape Sable, Nova Scotia. Massachusetts Bay lies between Cape Ann in northern Massachusetts and Cape Cod in southern Massachusetts. The Bay's most prominent submarine feature is Stellwagen Bank, a shallow, glacially deposited and primarily sandy feature that curves in a southeast to northwest direction for nearly 20 miles. Water depths at Stellwagen Bank range from 65 feet to more than 300 feet. Seaward of the Bank, the seafloor slopes to depths of more than 600 feet.

At its greatest distance from the coast, the Sanctuary is located approximately 25 miles east of Boston. However, its northern and southern bounds are only 3 miles offshore respectively of Gloucester and Provincetown. The Sanctuary boundary occurs entirely within federal waters (beyond the 3-mile limit of Massachusetts Commonwealth jurisdiction) and encompasses the entire Stellwagen Bank, all of Tillies Bank and Basin, and the southern portion of Jeffreys Ledge.

The Sanctuary's complex seafloor topography influences current flow and site productivity. In general, surface currents flow counterclockwise over Stellwagen Bank. Site productivity is seasonal with the overturning and mixing of ocean waters from deeper strata producing a complex and rich system of overlapping midwater and benthic habitats. This heightened seasonal productivity supports a large variety of marine mammal and fish species.

The Sanctuary serves as a critical feeding ground for numerous whales and other marine mammals, several of which are endangered. It may also be an important nursery area for certain of these species. The Sanctuary's multiple habitat types support a high diversity of fish species and an impressive assemblage of invertebrates. And, its rich forage base provides productive habitat for a wide variety of coastal and pelagic seabirds.

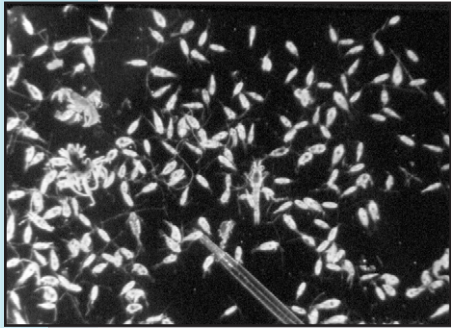
### Resource Highlights

The Sanctuary encompasses within its boundaries each of the four major seafloor habitat types - piled boulder, gravel, sand and mud - found in the Gulf of Maine. These habitats are spread across the series of banks and deep basins that make the Sanctuary the diverse topographic area that it is. This unique seafloor topography combines with tidal currents, seasonal mixing and annual circulation patterns to support a diverse array of species, from microscopic phytoplankton to large marine mammals.

#### Plankton - Life in the Water Column

The highest concentration of phytoplankton, and resulting peak in primary productivity, in the Sanctuary occurs from December through early April. During this period, more than 675 species of phytoplankton have been documented. Although there are common species occurring throughout the year, this spring bloom is characterized by both a higher number of species and higher overall abundance. A second, less-marked period of heightened productivity also occurs in mid to late summer, during July and August.

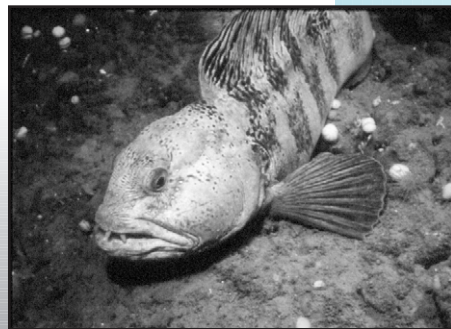
In contrast, the number of species of zooplankton (or secondary producers) in the Sanctuary remain relatively constant throughout the year. Though zooplankton do not experience seasonal fluctuations of the same magnitude as phytoplankton species, there is a distinct seasonal pattern to their abundance. Zooplankton production begins along coastal waters of Massachusetts north of Cape Ann during March. Production continues to expand throughout the southern Gulf of Maine and the Sanctuary throughout April, peaking by the end of May. The vast majority of the zooplankton species occurring in the Sanctuary is endemic to the Gulf of Maine.



The rich plankton community includes numerous types of small drifting animals but none more important than the ubiquitous copepods. Each copepod is smaller than a grain of rice, yet these tiny crustaceans provide sustenance to many creatures, including the massive northern right whale.

*Photographers:*  
(zooplankton) Tom Kleindinst,  
WHOI;  
(copepod close-up)  
NMFS staff





Studies of the seafloor show how different species use their habitats, such as the colorful redfish, pictured here sheltering among northern cerianthid anemones, and the fearsome-looking wolffish, which often hides in crevasses between boulders.

*Photographers: (both photos)  
Peter Auster and Paul  
Donaldson, NURC-UConn*

### **Benthic Invertebrates - Life on the Seafloor**

Every major taxonomic group of invertebrates that occurs in the global marine environment occurs in the Sanctuary specifically. Benthic invertebrates occur throughout the Sanctuary across all seafloor habitat types and constitute the major component of biological diversity. While large cerianthid anemones may be the most visible in a deep mud basin, sand dollars and sea stars might dominate the shallower sand areas. Structure-forming epifaunal invertebrates (such as sponges and anemones) provide critical nursery habitat for juvenile fish of many species (such as Atlantic cod and Acadian redfish), while the greater invertebrate community provides an important source of food for these and many other fish species in the Sanctuary.

### **A Diversity of Fishes**

Fish are a vital component of the Sanctuary's biological diversity, and are also one of its strongest links to the human population. The diverse seafloor topography in the Sanctuary supports a wide array of fishes. For instance, of the 176 fish species captured in more than two decades of government trawl surveys throughout the Gulf of Maine, 66 of those species have been sampled in the Sanctuary. Fish found in the Sanctuary range in size from small snake blennies to basking sharks, the largest of the fish occurring in the Sanctuary. Some fish, such as giant blue fin tuna, are annual migrants to the area, while others, such as Acadian redfish, are likely year-round residents.

The groundfish community in the Sanctuary, made up of fishes such as cod, haddock, whiting (silver hake), and various flatfish, has been sought for food from the earliest European settlements to the present. And the sand lance, whose populations are seasonally prolific in the Stellwagen Bank environment, serves as the primary prey of Humpback whales feeding within the Sanctuary.

### **Sea Turtles Among Us**

The Sanctuary is the seasonal home to two species of endangered sea turtles, the Atlantic or Kemp's ridley and the leatherback. The leatherback is a regular summer visitor and is the only species of sea turtle that journeys to cold waters for feeding activities. Likely prey include jellyfish and other jelly organisms abundant in these waters during the summer. Atlantic ridleys are observed in waters off Massachusetts as juveniles, having either swum or drifted north in the Gulf Stream from hatching areas off the southern coast of Mexico. Southern New England waters are important feeding grounds for ridleys.

### Whales on the Horizon

Large cetaceans are the most visible occupants of Sanctuary waters. Seventeen species are known to frequent the Sanctuary, and rare sightings of two additional species have been recorded. Because of their large size, flamboyant behavior, and distinctive markings, Humpback whales (*Megaptera novaeangliae*) are perhaps the most observed and easily identified of the Sanctuary's cetaceans. Feeding assemblages of over 40 animals are common during the Spring, Summer and Fall. The species was first scientifically described based on observations made of an individual taken off the coast of Maine, and hence, the Latin name *novaeangliae*, which means "New England."

Northern right whales are the most seriously depleted species of large cetaceans. Given its endangered status, the photo-identification of at least 100 northern right whales using the Sanctuary and adjacent waters seasonally indicates the particular importance of this system to a significant portion (about one third) of the existing total North Atlantic population for feeding and nursing activities. Fin (or Finback) whales, the second largest of the World's whales, are the most common species of large baleen whale in the Gulf of Maine and are regularly seen in the Sanctuary, along with the smaller Minke whales.

The most frequently observed toothed-cetacean is the white-sided dolphin, with single groups sometimes numbering over 1,000 individuals. Pilot whales and harbor porpoise are also frequent. Orca (or killer) whales are occasionally observed on Stellwagen Bank, where they are thought to follow schools of bluefin tuna from mid-July to September.

### The Presence of Pinnipeds

Two pinniped species are known to occur in Sanctuary waters, the harbor seal and the gray seal, though neither are common. Harbor seals, the more common of the two species in the Sanctuary, range from Labrador to Long Island, New York, and is the most abundant pinniped species in eastern United States waters. Gray seals are the most abundant pinniped species occurring in southern areas of eastern Canada, from Labrador south through the Bay of Fundy.

### An Abundance of Seabirds

Over 40 species of marine birds are found throughout the year in the vicinity of the Sanctuary. The distribution and abundance of seabird species in the Sanctuary are related, as they are in other parts of the Gulf of Maine, to the availability of preferred prey (such as fish and fish larvae, cephalopods, crustaceans and offal). With a single exception (Leach's storm petrel), all seabirds occurring within the Sanctuary are either migrants or non-breeding residents. The high levels of biological productivity in the Sanctuary, combined with the presence of fishing vessels, result in a predictable and abundant variety of associated species of both coastal and pelagic seabirds.

An active feeding aggregation of humpback whales breaks the sea surface indicating that a school of sand lance is in the area. Seabirds, such as these greater shearwaters, also rely on the bounty of Stellwagen Bank.

Photographers:  
(whales) David Wiley, IWC;  
(birds) Dann Blackwood, USGS

